



PELP1: A Potential Biomarker for Breast Cancer Initiation

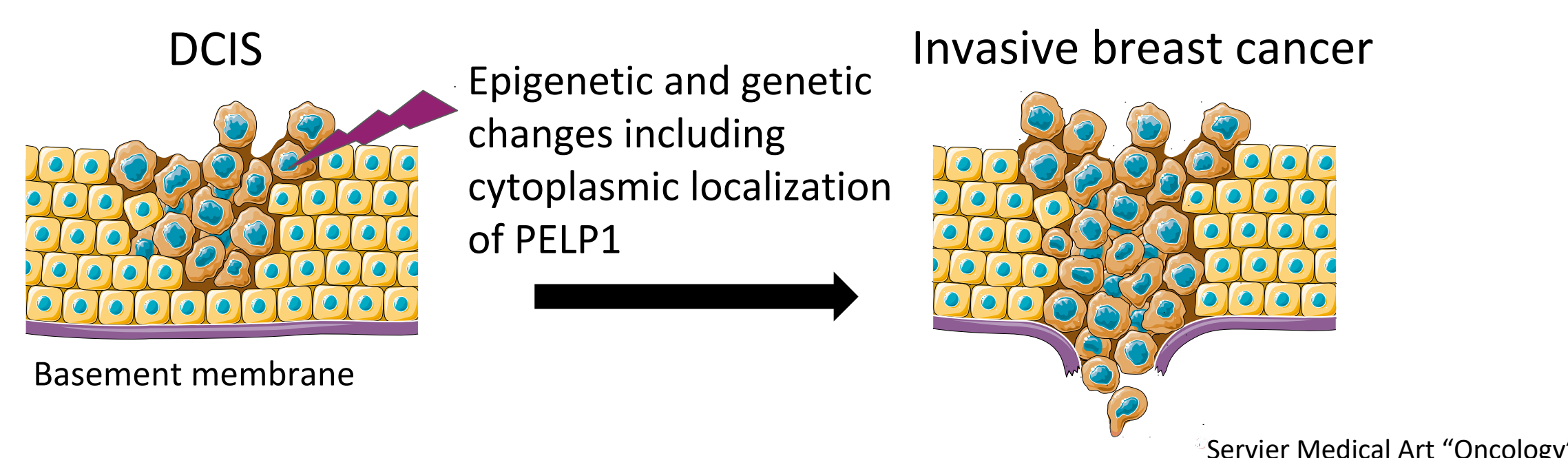
Olivia Wicker and Julie Ostrander, Ph.D.
Department of Medicine



Introduction

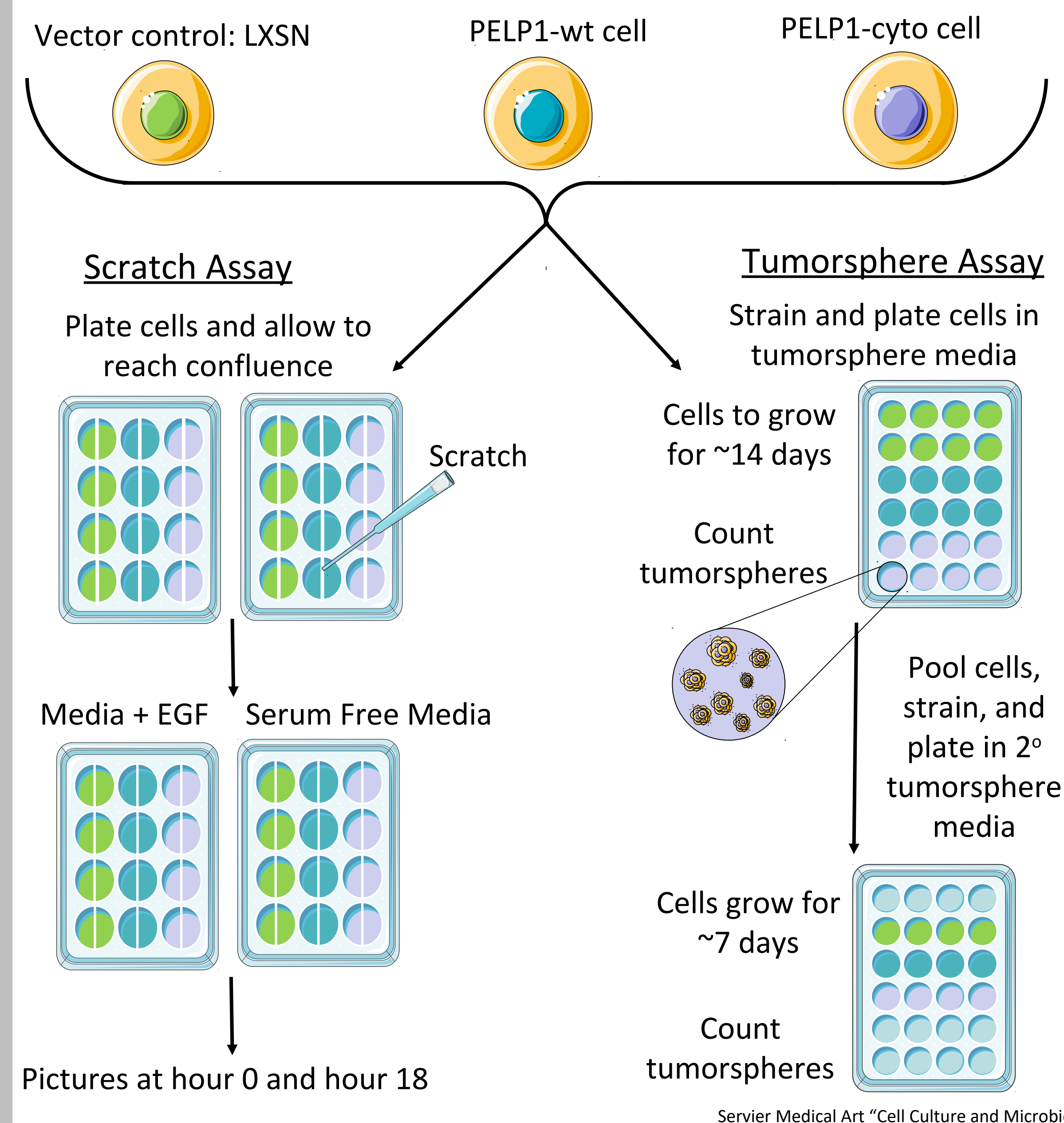
PELP1 (proline, glutamic acid, and leucine rich protein 1) is an estrogen receptor co-activator protein that is a potential biomarker for breast cancer. It normally localizes in the nucleus of cells, but is found to localize in the cytoplasm in 40% samples from women at high-risk for developing breast cancer. For pre-cancerous lesions, such as ductal carcinoma in situ (DCIS) to become invasive breast cancer, cells must acquire genetic and epigenetic changes that allow them to invade through the basement membrane.

I hypothesize that PELP1 cytoplasmic signaling participates in breast cancer initiation by promoting epithelial cell migration and stem-cell phenotype, making it a good potential biomarker for breast cancer.



Methods

SUMM225: DCIS cell line



Results

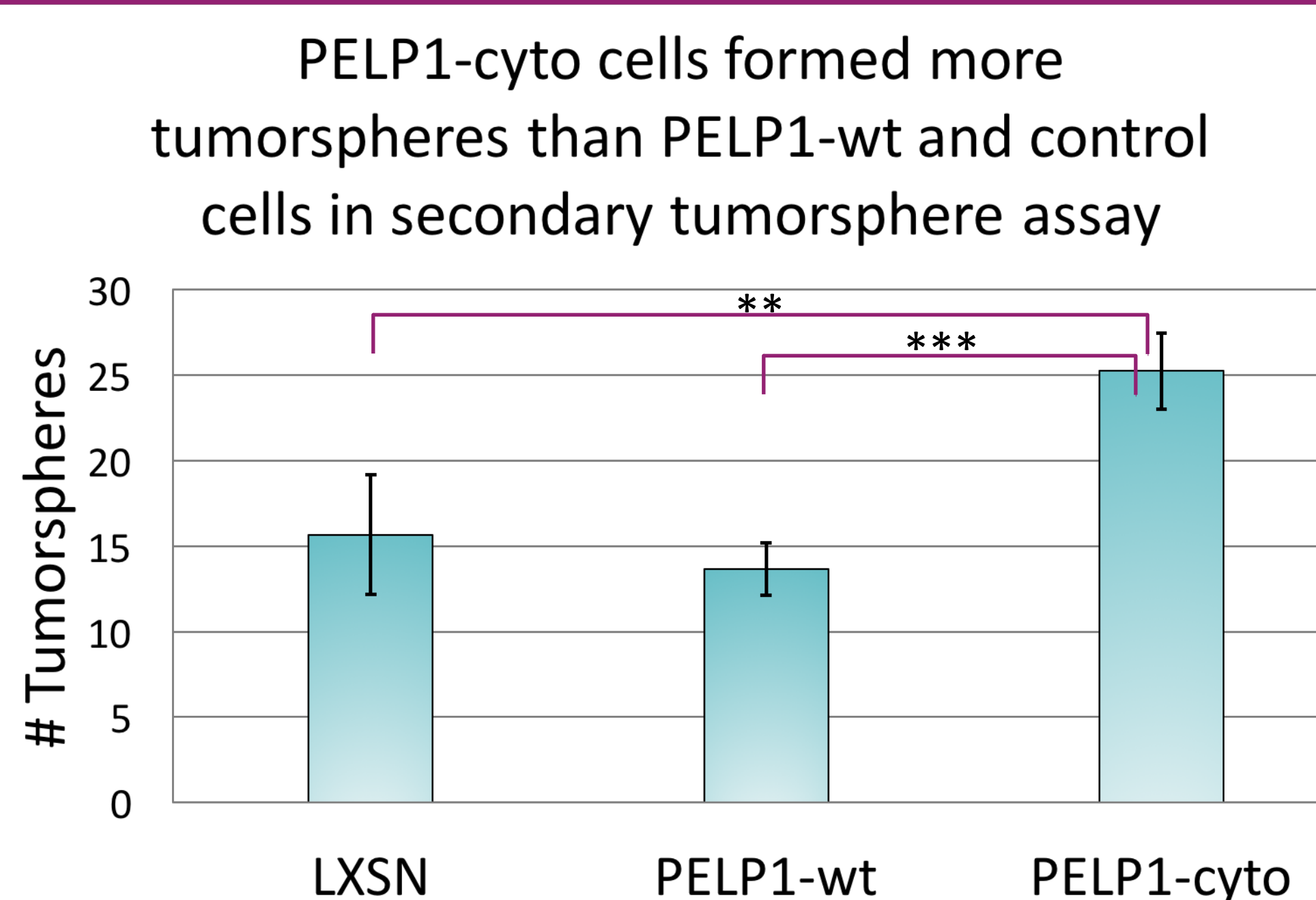
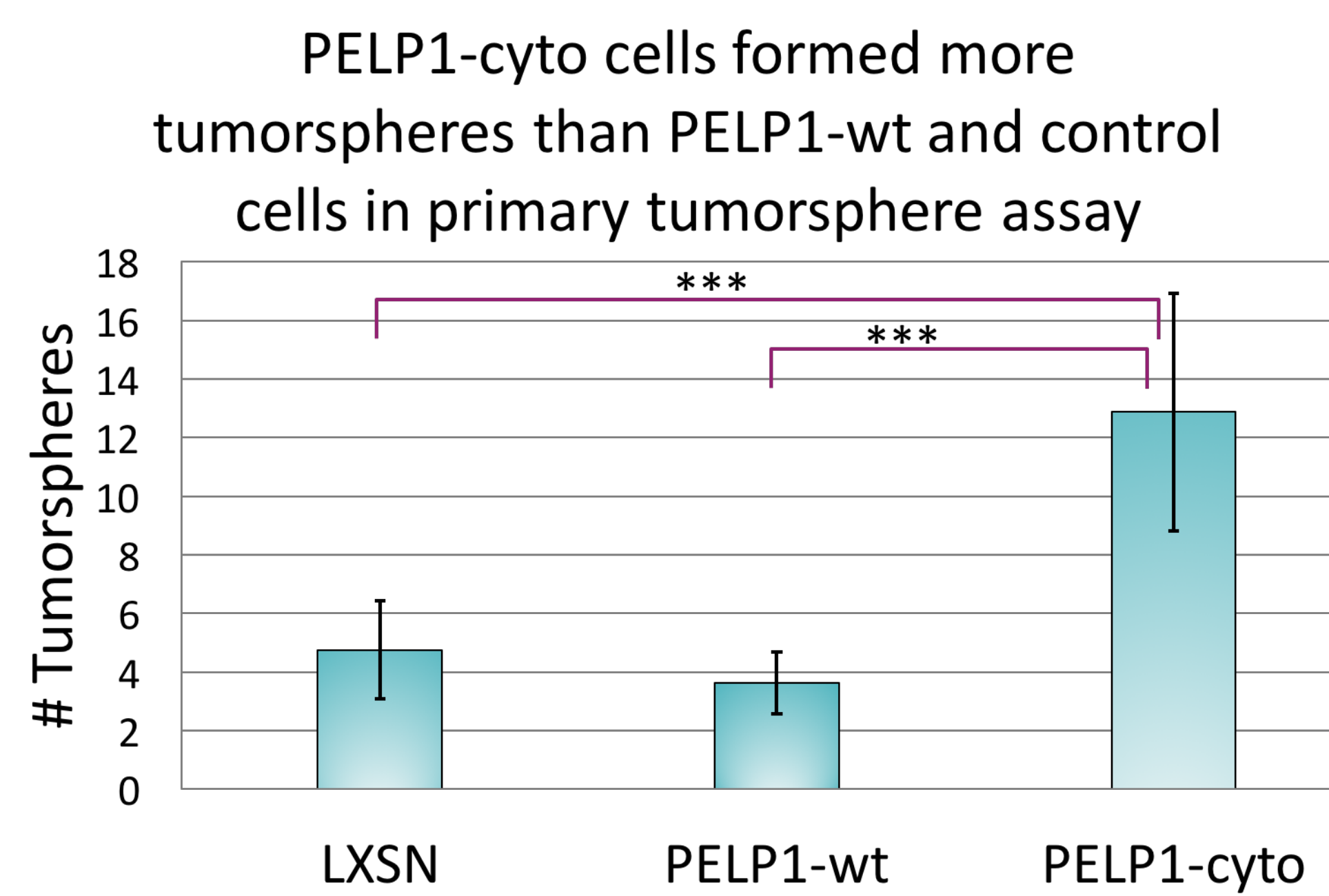


Figure 1: PELP1-cyto cells formed significantly more tumorspheres than PELP1-wt and control cells in both 1° and 2° tumorsphere assays. In the 2° tumorsphere assay, PELP1-cyto cells formed larger tumorspheres than other cells.

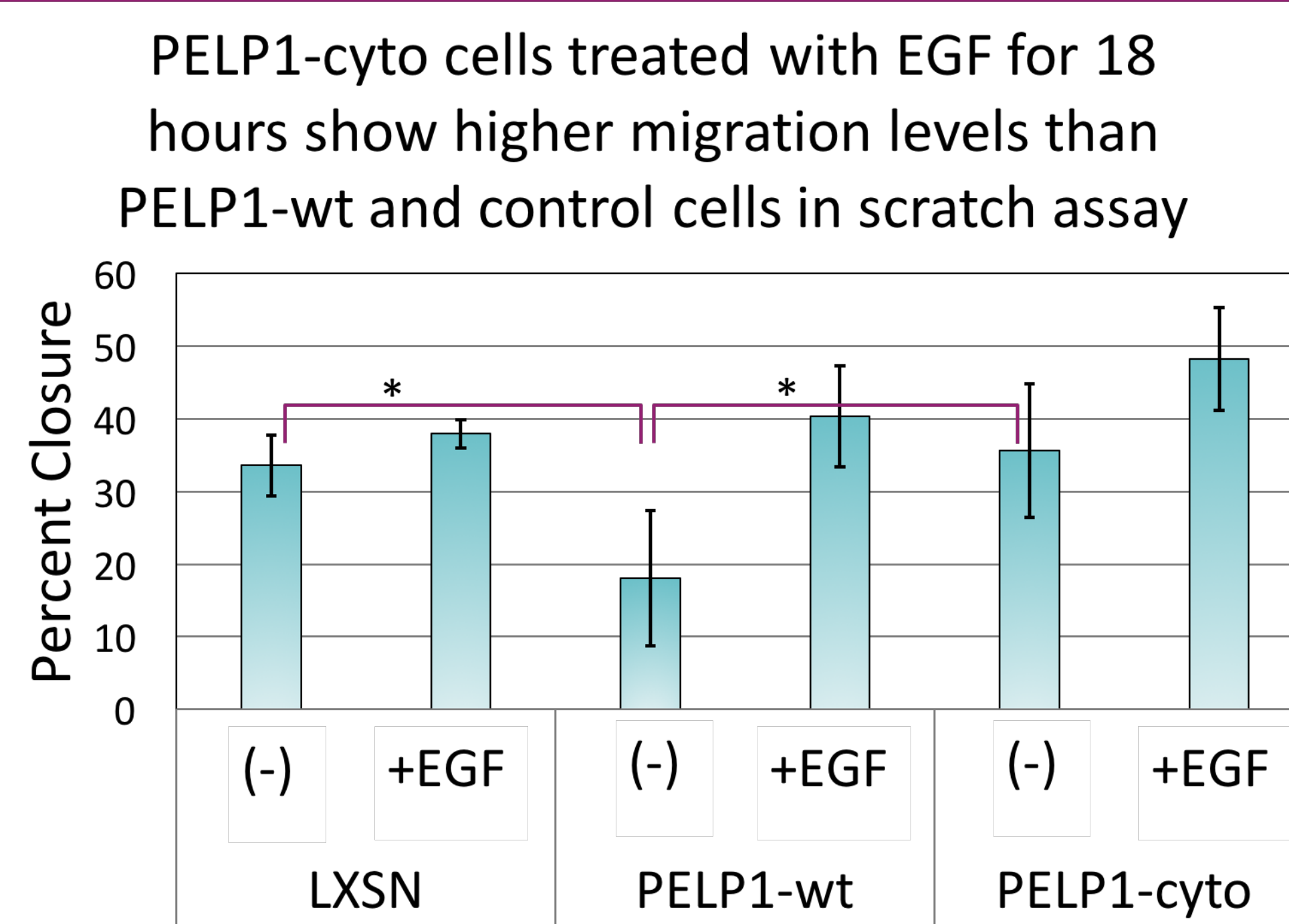


Figure 2: PELP1-cyto cells treated with EGF had higher migration levels, as shown by percent closure, than PELP1-wt or control cells. Untreated PELP1-wt cells showed significantly lower migration levels than PELP1-cyto and control cells.

Discussion

The tumorsphere assay demonstrated the ability of PELP1-cyto cells to form tumorspheres, suggesting that cytoplasmic localization of PELP1 promotes a stem-cell phenotype. Tumor cells with stem cell phenotypes and typically also have a migratory phenotype.

The scratch assay, while not significant, was trending towards showing that PELP1-cyto cells have greater migratory ability than PELP1-wt cells. This would suggest that cytoplasmic localization of PELP1 may allow for increased migration of pre-cancerous cells.

Increased migratory ability and returning to a stem cell phenotype are traits seen in cells progressing toward cancer.

Future Directions

Could PELP1 a biomarker for breast cancer? More studies need to be done to find out.

- Transwell assays can be performed to further test migration and invasion.
- Gene expression analysis can be performed with qPCR.
- Cells could be tested for tumorigenicity *in vivo* a mouse model using intraductal injection into the breast duct to mimic DCIS.

PELP1 as a biomarker could be used clinically to determine which women will likely develop breast cancer, and could be used to make treatment decisions.

Acknowledgements

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